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The Incorporation of Health Impact Analysis into Land Use Regulation: Using Health Impact Assessments to Promote Sustainable, Healthy Communities

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THE INCORPORATION OF HEALTH IMPACT ANALYSIS INTO LAND USE REGULATION: USING HEALTH IMPACT ASSESSMENTS TO PROMOTE SUSTAINABLE, HEALTHY COMMUNITIES

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I. INTRODUCTION

A variety of health conditions are increasingly being connected to land use decision-making.[1] Land use decisions, or policies that encourage suburban sprawl, can contribute to various adverse health impacts derived from neighborhoods that are not conducive to physical activity and increased traffic congestion that contributes to air pollution.[2] Other land use activities over time have resulted in populations being segregated by race or class or disproportionate noxious land uses in largely minority or low-income neighborhoods.[3] Moreover, issues such as the availability of affordable housing, access to healthy food options, and even the presence of the natural environment all influence the health and vibrancy of our communities.[4]

While the land use regulatory system can address the health problems in communities using a variety of regulatory measures, health impact assessments ("HIAs") are emerging as an evidence-based tool designed to demonstrate the costs and benefits of a particular land use decision (or

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[1] *See Land Use Planning for Public Health: The Role of Local Boards of Health in Community Design and Development*, NAT'L ASS'N OF LOCAL BOARDS OF HEALTH (2006), http://www.cdc.gov/healthyplaces/publications/landusenalboh.pdf.

[2] *See* David B. Resnik, *Urban Sprawl, Smart Growth, and Deliberate Democracy*, 100 AM. J. OF PUB. HEALTH 1852 (2010).

[3] *See* Juliana Maantay, *Industrial Zoning Changes in New York City A Case Study of "Expulsive" Zoning*, CITY U. OF N.Y. 63, http://www.lehman.cuny.edu/deannss/geography/publications/MaantayArticle_Projections.pdf (last visited Sept. 20, 2015).

[4] *See Where We Live Matters for Our Health: Neighborhoods and Health*, ROBERT WOOD JOHNSON FOUND. (2008), http://www.commissiononhealth.org/PDF/888f4a18-eb90-45be-a2f8-159e84a55a4c/Issue%20Brief%203%20Sept%2008%20-%20Neighborhoods%20and%20Health.pdf.

other policy decision) on public health objectively.[5] Although not widely used in the United States, HIAs have been used in other countries to address the health impacts of various land use decisions.[6] This paper argues that HIAs are an appropriate tool to address public health disparities associated with land use decision-making. Although the land use regulatory system is insufficient by itself to protect public health, HIAs can be part of an interdisciplinary approach to public health through land use decisions, and could possibly be employed similarly to environmental impact assessments. Federal and state legislation could require their use in certain land use decisions, as well.

This article first outlines the basic relationship between land use and pubic health, beginning with a brief historical account of this relationship. Next, it describes the HIA as a tool, including examples of its use in the land use context. Although limited in nature, this emerging practice of using HIAs can serve as a guide for an effective interdisciplinary approach to protect public health through the land use regulatory system. Finally, this paper outlines various forms of land use regulation, the authority for incorporating health impact assessments into this structure, and methods for such an incorporation. Additionally, this paper addresses the barriers to effective use of HIA in land use regulation.

II. THE RELATIONSHIP BETWEEN LAND USE AND PUBLIC HEALTH

A. The Historical Connection Between Land Use and Public Health

Over the past several years, a growing body of scholarship has been dedicated to connecting land use principles with public health.[7] However, this connection is not new or unique to the modern era. In fact, the initial implementation of land use regulations, and later zoning principles, were created with the prime purpose of addressing public health and safety issues.[8] Although these connections eroded over time as zoning evolved to preserve private property rights and quality of life instead of continuing to focus on public health, police power concerns and nuisance liability are part

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[5] *See* INTEGRATING PLANNING AND PUBLIC HEALTH: TOOLS AND STRATEGIES TO CREATE HEALTHY PLACES 73 (Marya Morris ed., 539/540, Am. Plan. Ass'n 2006).

[6] INTEGRATING PLANNING AND PUBLIC HEALTH, *supra* note 5.

[7] *See, e.g.*, Shobha Srinivasan et al., *Creating Healthy Communities, Healthy Homes, Healthy People: Initiating a Research Agenda on the Built Environment and Public Health*, 93 AM. J. OF PUB. HEALTH 1446 (2003); Lawrence D. Frank & Peter O. Engelke, *The Built Environment and Human Activity Patterns: Exploring the Impacts of Urban Form on Public Health*, 16 J. OF PLAN. LITERATURE 202 (2001).

[8] Joseph Schilling & Leslie S. Linton, *The Public Health Roots of Zoning: In Search of Active Living's Legal Genealogy*, 28 AM. J. OF PREVENTIVE MED. 96, 97 (2005).

of a broader set of functions that the land use regulatory system serves.[9] Indeed, the protection of public health and safety plays a fundamental role in land use regulation across several legal, functional, and structural dimensions, including nuisance, private property, zoning and police power functions, and environmental law.

The modern land use regulatory system is at least partially rooted in the common law of nuisance.[10] Although traditionally nuisance has been characterized as a restraint on private property, some scholars argue that nuisance law is actually at the heart of private property ownership because it gives owners the positive right to complain about intrusions against another's use and enjoyment of the property.[11] Therefore, nuisance law can be seen as a pivotal source of property rights that allow the landowner to protect her interest, rather than a restraint on liberty.[12] So, if seen as a source of property rights, nuisance law would allow a landowner to protect her health from a neighboring noxious land use because it would interfere with her enjoyment of her property rights.[13]

The state and local police power also allowed governments to effectively regulate land uses by encouraging or prohibiting activities that adversely impacted public health.[14] As rapid growth during the Industrial Revolution created public health concerns such as disease and fire, which largely arose due to overcrowding and unsanitary conditions, local and state governments passed legislation aimed at protecting the public health, safety, and welfare.[15] In time, "state courts and legislatures effectively melded the common law of public nuisance with the laws created under the police powers as both institutions sought to expand government's ability to protect public health and safety."[16]

These initiatives largely advocated a separation of incompatible land uses in an attempt to protect public health. In this context, the United States Supreme Court upheld the constitutionality of zoning regulations that attempted to segregate industrial and business activity from residential

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[9] *Id.* at 99.

[10] *Id.* at 98; *see* 44 Plaza Inc. v. Gray-Pac Land Co., 845 S.W.2d 576, 578 (Mo. Ct. App. 1992).

[11] Eric T. Freyfogle, *Property and Liberty*, 34 HARV. ENVTL. L. REV. 75, 98 (2010).

[12] *Id.*

[13] Note that even private controls on land, such as restrictive covenants, aim to prevent nuisances, promote property values, and preserve quality of life. *See* Robert C. Ellickson, *Alternatives to Zoning: Covenants, Nuisance Rules, and Fines as Land Use Controls*, 40 U. CHI. L. REV. 681, 721 (1973).

[14] *See* Schilling & Linton, *supra* note 8, at 99; U.S. CONST. amend. X.

[15] *See id.* at 98; Patricia E. Salkin, *From Euclid to Growing Smart: The Transformation of the American Local Land Use Ethic Into Local Land Use and Environmental Controls*, 20 PACE ENVTL. L. REV. 109, 110 (2002). An example of such a law is New York City's Tenement House Act of 1901, which sought to improve living conditions, and thus public health, by regulating the construction of dwelling units.

[16] Schilling & Linton, *supra* note 8, at 99.

activity in the name of public health.[17] In *Village of Euclid v. Ambler Realty*, the Court upheld an ordinance restricting the locations of trades, industries, and dwellings, as well as the size and height of buildings, so that only certain structures based on size and use could be erected in certain areas of the city.[18] While the Court approved Euclidian zoning as a valid exercise of the state police power, it noted that the exclusionary citing of certain land uses bore a rational relationship to the protection of the public heath and safety of the community.[19] In support, the Court relied on studies emphasizing the public health benefits of zoning, such as greater efficiency in fire protection, a more secure and safe home life, the prevention of street accidents by reducing traffic tied industry, a decrease in noise and other stressors associated with mental disorders, and a more favorable child rearing environment.[20] Therefore, the protection of the public health and safety seemed to be an important reason for the emergence of zoning systems, as well as one of the chief justifications used by the Supreme Court in upholding the constitutionality of zoning.

Additionally, environmental laws have their roots in the protection of public health rather than land use concerns.[21] As environmental law evolved to regulate areas that overlapped with planning such as sanitation, regulation of wetlands, preservation of open space, and other conservation measures, land use restrictions were imposed through the environmental regulatory system.[22] Although not a part of the land use system per se, environmental regulation, like the law of nuisance, the police power, and other forms of private property rights, are part of a broader set of functions that the land use regulatory system serves, with public health and safety playing a central role.

The land use system serves a predominantly mediating function, and therefore acts as a liaison between varied places, interests, and environments, balancing the relationships between people and places; nature and the built environment; and ecology and humanity.[23] Public health is thus an integral force in several areas of land use, from private property, nuisance, police power functions, environmental law, and even other areas. As a mediating system, the land use system is equipped to

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[17] Vill. of Euclid v. Amber Realty, 272 U.S. 365, 388-89 (1926).

[18] *Id.* at 379-80.

[19] *Id.* at 391.

[20] *Id.*

[21] Nancy Perkins Spyke, *The Land Use Environmental Law Distinction: A Geo-Feminist Critique*, 13 DUKE ENVTL. L. & POL'Y F. 55, 62 (2002).

[22] *Id.*

[23] Craig Anthony Arnold, *The Structure of the Land Use Regulatory System in the United States*, 22 J. LAND USE & ENVTL. LAW 441, 461 (2007).

balance varying interests while keeping public health as a consideration, and often in a prime role, because of its ability to balance varied spaces and interests.

Throughout the twentieth century, public health and land use regulation continued to connect to one another around specific issues such as housing, blighted neighborhoods, and urban renewal.[24] However, health largely remained in the background of planning as planners focused on aesthetics, form, and economics instead of health, as evidenced by the City Beautiful movement or Daniel Burnham's "Plan for Chicago."[25] At the same time, public health professionals began to focus on the germ theory of disease, which led to an individualized focus on public health centering on personal behavior rather than community conditions.[26] Therefore, health remained largely separate and distinct from planning, absent several independent initiatives.[27] Land use and planning focused on resources and economic development, while public health officials concentrated their efforts on public health in general.[28]

However, by the 1990s, scholars began to reconnect the concept of land use and public health as the public health impacts of suburban sprawl became more apparent. Similar to the early connection between land use and health, which centered around crowded, disease infested cities, the new collaboration across disciplines again focused on the connection between the environments in which people live and the resulting health effects. However, by the twentieth century the predominant health concern was no longer infectious diseases, but chronic illness related to, and exacerbated by, the rise in obesity and lack of physical activity.

B. Contemporary Connections Between Land Use and Public Health

Currently, the connection between land use and public health is apparent in a multitude of areas. However, individuals often cite personal behaviors, such as diet and exercise, or family history, as the prime cause of poor health, failing to connect their personal health to the physical environment in which they live.[29] Additionally, a recent study found that while over half of planners and public health officials see the connection between their disciplines as an important policy issue, these groups felt that

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[24] David Charles Sloane, *From Congestion to Sprawl: Planning and Health in the Historical Context*. 72 J. OF THE AM. PLAN. ASS'N 1, 12 (2006).

[25] Arnold, *supra* note 23.

[26] *Id.*

[27] *Id.* at 12-13.

[28] *Id.* at 14.

[29] INTEGRATING PLANNING AND PUBLIC HEALTH, *supra* note 5.

public officials who allocate staff and resources saw the connection as less important, which presented a barrier to effective collaboration.[30] Moreover, public health impacts extend to disciplines beyond land use and public health, such as transportation, affordable and quality housing, air pollution, economics, and mental health. The broad impact of public health concerns suggesting collaboration beyond the public health and land use planning disciplines would be beneficial. Although barriers to addressing the land use/public health connection exist, planning and land use regulation can alleviate the effect of development in a variety of practices that impact public health. These areas include transportation, social conditions, and isolated communities, as well as other problems connected to these areas.

1. Transportation

A prominent impact of land use decisions on health results from land use patterns that require an increasing dependence on automobile transportation. While zoning ordinances initially separated residential land uses from all other land uses, as the size of cities increased, this plan began to disfavor mixed-use developments where people could walk or use public transportation to access grocery stores, retail shops, or their places of business.[31] Furthermore, the increase in suburban developments favor disconnected cul-de-sacs that are not connected to street grids, making walking inefficient.[32] As a result of these, and other land use plans, transportation has become exceedingly automobile dependent. Furthermore, associated health risks have materialized. For example, a lack of physical activity because of automobile dependence can lead to obesity, which in turn is a risk factor for chronic illnesses such as heart disease.[33] Additionally, increased automobile usage results in enhanced air pollution, notably ground level ozone and particulate matter, which can cause or exacerbate lung and respiratory diseases, including asthma.[34] Finally, the lack of safe pedestrian amenities such as sidewalks or crosswalks, coupled with increased congestion, time spent in automobiles, and the number of

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[30] *Id.* at 3.

[31] *See* Lawrence D. Frank et al., *Many Pathways from Land Use to Health: Associations Between Neighborhood Walkability and Active Transportation, Body Mass Index, and Air Quality*. 72(1) J. AM. PLAN. ASS'N 75 (2006).

[32] *Id.*

[33] *See* Scott Doyle et al., *Active Community Environments and Health: The Relationships of Walkable and Safe Communities to Individual Healh*. 72(1) J. AM. PLAN. ASS'N 19 (2006); *See* Risa Lavizzo-Mourey & J. Michael McGinnis, *Making the Case for Active Living Communities*, 93 J. AM. PLANN. ASS'N 19 (2003).

[34] Srinivasan et al., *supra* note 7, at 1447.

people driving, results in more deaths and injuries from motor vehicles.[35] Also, there is arguably an increase in pedestrian injuries due to automobile accidents and mental and physical stresses due to increasingly long commute times and traffic jams.

Land use planning can address problems of transportation by promoting mixed-use developments, increasing street connectivity, expanding regional public transit and trail networks, and making pedestrian investments and transit investments concurrent with land-use decisions.[36] These types of initiatives not only encourage walking, which combats obesity, but would reduce dependence on transportation and improve air quality, while making communities saferfor pedestrian travel.

2. *Community and Social Conditions*

Community and social conditions can largely impact the health of a population. Housing quality, socio-economic disparities, social isolation, disconnectedness from nature, crime, social capital, and a lack of community power are all a function of land use decisions. All affect community health, too. Although these land use/public health connections are not as directly apparent as those relating to community design, transportation, poor air quality, and asthma, studies on the social determinants of health strongly correlate community conditions and stress levels with health.[37] Although the relationships are not as precise, it is important to consider the more indirect impacts of land use decision making on public health because neighborhood improvement strategies should address the totality of the issues affecting community health.

C. Housing and Socio-economic Conditions

Those living in low-income and minority neighborhoods are often at a higher risk for unfavorable mental and physical health conditions.[38] Indeed the association between adverse health impacts and sub-standard housing has been recognized for decades, as lead, pests, air contaminants, and greater exposure to crime all impact the health of residents.[39] However, emerging research indicates that dilapidated housing conditions also affect the mental health of residents, causing anxiety, depression, aggressive

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[35] *Id.*

[36] INTEGRATING PLANNING AND PUBLIC HEALTH, *supra* note 5, at 35.

[37] *Id.* at 37.

[38] *See* Tama Leventhal & Jeanne Broks-Gunn, *Moving to Opportunity: An Experimental Study of Neighborhood Effects on Mental Health*, 93 AM. J. PUB. HEALTH 1576 (2003).

[39] *See* Srinivasan et al., *supra* note 7, at 1447.

behavior, and attention deficit disorder, not to mention physical health impacts such as asthma, heart disease, and obesity.[40]

This problem is exacerbated because persons living in low-income communities traditionally have fewer options regarding housing stock, healthy food options, and access to green space, all of which promotes outdoor activity and mental health, while also decreasing social isolation.[41] Moreover, inadequate maintenance and housing construction also seems to plague these neighborhoods, which results in insufficient housing and overcrowding, and thus health problems.[42] Finally, utilizing green building design principles or strategies that maximize energy efficiency or minimize indoor air contamination can greatly impact public health, but are not likely to be used where housing construction is already substandard.[43]

D. Social Isolation

Moreover, evidence suggests that socially isolated and sedentary lifestyles also have public health costs.[44] Social isolation occurs not only in sprawling disconnected communities, but it can also be a product of racial segregation or a lack of connection between residents living in a particular community. In each of these situations, community residents are isolated because their communities lack structures that draw residents together. As a result, the communities promote isolation. For example, in blighted urban areas a fear of crime, coupled with a lack of green space or safe neighborhood businesses for residents to congregate, contributes to isolated communities. In suburban areas, geographic isolation and communities tailored to motorists, instead of people, might discourage community connectivity and weaken social ties.[45]

The health impacts of social isolation include both mental and physical health. Eric Klineberg studied the mortality rates in two Chicago neighborhoods during the July 1995 heat wave and found that residents who lived in neighborhoods with commerical activity were less likely to perish or suffer injuries in the heat wave than residents in crime-ridden neighborhoods.[46] This was particularly true of elderly residents, where lack

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[40] *See id.*

[41] *See id.*

[42] *See id.*

[43] Howard Frumkin, *Healthy Places: Exploring the Evidence*, 93 AM. J. PUB. HEALTH 1451, 1453 (2003).

[44] *See* Srinivasan et. al., *supra* note 7, at 1447.

[45] INTEGRATING PLANNING AND PUBLIC HEALTH, *supra* note 5, at 48; Srinivasan et al., *supra* note 7, at 1447.

[46] *See* ERIC KLINEBERG, HEAT WAVE: A SOCIAL AUTOPSY OF DISASTER IN CHICAGO (Chi. U. Press 2002).

of social connectivity caused many to perish in their homes because community members were not looking after them.[47] Another study, conducted over decades in a small Pennsylvania town, found that as the community modernized and experienced a decrease in social interaction and connectedness, the rate of heart disease in the community increased.[48]

Finally, racial segregation, which is somewhat rooted in exclusionary zoning and other land use decision-making techniques, can also have physical, mental, and economic impacts. William Julius Wilson, who studied social and economic exclusion based on race, found that African Americans who live in highly segregated areas experience social isolation such as decreased interaction with families, institutions, and individuals involved in main-stream society.[49] Wilson concluded that this type of isolation deprived minorities of access to social networks and resources that advance economic opportunities.[50] As a result, communities that are not "tightly knit" have loose social ties, which limits upward mobility and access to information.[51]

As a result, land use decision-making that promotes social connectivity within and between communities can improve socio-economic conditions, mental health, and physical health. Creating more walkable communities, multi-use districts that incorporate shops into residential neighborhoods, and greenspaces and parks can encourage community residents to interact with one another and promote better community cohesion, all of which can improve community health overall.[52]

E. Connection to Nature and Mental Health

Human disconnectedness with nature can cause social isolation, but also impacts physical and mental health. Stephen Kellert has shown that the human connection to the natural environment is crucial to both physical and mental health.[53] Other evidence supports this view. One researcher found that patients who stay in hospital rooms that have a view

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[47] *Id.*

[48] *See* ICHIRO KAWACHI & BRUCE P. KENNEDY, THE HEALTH OF NATIONS 155-58 (The N. Y.Press 2002).

[49] *See* KAWACHI & BERKMAN, NEIGHBORHOODS AND HEALTH 294-95 (Oxford U. Press 2003).

[50] *See id.*

[51] *See id.* at 299.

[52] INTEGRATING PLANNING AND PUBLIC HEALTH, *supra* note 5, at 50.

[53] Arnold, *supra* note 23, at 466 (citing STEPHEN R. KELLERT, BUILDING FOR LIFE: DESIGNING AND UNDERSTANDING THE HUMAN-NATURE CONNECTION (Island Press 2005)).

of nature experienced a speedier recovery post-operatively.[54] Other studies have shown exposure to nature increases emotional, cognitive, and ethical development in children and adolescents, while decreasing stress and increasing work productivity.[55] Therefore, the connection to nature seems to be an important design characteristic of neighborhoods intending to promote both physical and mental health of the residents who live there.

F. Crime

Crime and fear of violence are associated with neighborhood characteristics and the built environment. Housing configurations[56], social isolation, walkability, and access to alcohol, firearms, or tobacco[57] all involve land use decisions and affect crime. While safe neighborhoods are necessary to encourage community quality of life and common values, social isolation seems to be correlated with crime in poorer neighborhoods.[58] Additionally, low crime rates and citizen perception of safety tends to be a relevant factor in the economic and social well-being of the neighborhood.[59]

Numerous studies linked crime rates to public health in communities. The direct effects of crime on public health include homicide, violence, substance abuse, and dangerous driving.[60] The "eyes on the street" concept, created by Jane Jacobs in *The Death and Life of American Cities*, postulates that mixed use developments, which encourage pedestrian activity at all hours of the day, deter crime.[61] Additionally, community design features such as creating visual links between housing and public space, minimizing access to buildings to more easily identify criminals, and creating neighborhoods that support social interaction, are land use techniques that have been advocated in reducing crime in communities.[62] Overall, the

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[54] Frumpkin, *supra* note 43, at 1452 (citing R.S. Ulrich, *View Through a Window May Influence Recovery from Surgery*, 224 SCI. MAG. 420, 420-21 (1984)).

[55] *Id.* at 1453.

[56] Andrew L. Dannenberg et al., *The Impact of Community Design and Land-Use Choices on Public Health: A Scientific Research Agenda*. 93 AM. J. PUB. HEALTH 1500, 1503-04 (2003).

[57] Marice Ashe et al., *Land Use Planning and the Control of Alcohol, Tobacco, Firearms, and Fast-Food Restaurants*, 93 AM. J. PUB. HEALTH 1404-08 (2003).

[58] *Gothenburg Consensus Paper December, 1999*, EUROPEAN CENTRE FOR HEALTH POL'Y, *available at* http://www.apho.org.uk/resource/item.aspx?RID=44163 (last visited Oct. 18, 2015) [*hereinafter* Gothenburg Paper].

[59] INTEGRATING PLANNING AND PUBLIC HEALTH, *supra* note 5, at 37.

[60] *Id.*; Jim McManus *Better Health, Lower Crime: A Briefing for the NHS Partner Agencies*, LONDON: NACRO (2001), *available at*, www.nacro.org.uk/templates/publications/resources.cfm?frmSiteID=1.

[61] INTEGRATING PLANNING AND PUBLIC HEALTH, *supra* note 5, at 38.

[62] *Id.* at 38-39.

research shows that "public safety is the cornerstone of vital, economically productive, and livable communities."[63]

III. HIAS AND OTHER FORMS OF HEALTH IMPACT ANALYSIS

A health impact assessment ("HIA") is a tool that has recently been advocated by health agencies, including the World Health Organization ("WHO"), for use in governmental planning and decision making.[64] As most commonly described, a HIA is "a combination of procedures, methods and tools by which a policy, program or project may be judged as to its potential effects on the health of a population, and the distribution of those effects within the population."[65] The process is multidisciplinary in nature and considers a wide range of economic, social, political, psychological, and environmental factors in the analysis.[66] Thus, the purpose of a HIA is to identify policies or activities likely to have a major impact on a population's health, and to reduce the harmful health effects while increasing beneficial effects.[67]

A. Elements and Values of the HIA

Health impact assessments include four basic elements. First, the assessment should analyze the evidence concerning the perceived relationships between a policy, program, or project, and the health of a particular group of people.[68] The population can include either the entire population, or separate groups within the population.[69] Second, the assessment should look to those who are likely to be affected by the program and consider their experiences, expectations, and opinions.[70] Next, the assessment should present decision makers, as well as the public, with more information as to the effects of the policy, program, or project on public health. [71] Finally, proposals for adjustments to the proposed project, program, or policy based on public health concerns should be made

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[63] *Id.* at 39

[64] Gothenburg Paper, *supra* note 58.

[65] *Id.* at 4.

[66] *An Overview of Health Impact Assessment*, N. & YORK PUB. HEALTH OBSERVATORY, *available at* www.phel.gov.uk/hiadocs/200_overview_of_hia_occasional_paper_1.pdf (last visited Nov. 9, 2007).

[67] Gothenburg Paper, *supra* note 58, at 1.

[68] *Id.* at 5.

[69] *Id.*

[70] *Id.*

[71] *Id.* at 6.

to decision makers.[72] The proposal should be one that maximizes positive health impacts while minimizing negative health impacts.[73] Values such as democracy, equity, sustainable development, and ethical use of evidence should be considered at all stages of the process.[74]

Behind the elements of a HIA exist five basic characteristics. First, as stated above, the goal of a HIA is to inform policy makers of possible health outcomes of proposed policies to enable an informed policymaking agenda that is sensitive to those risks.[75] Therefore, the starting point for the assessment is a proposed policy, program, or project. [76] Second, the HIA analyzes both negative and positive health risks from an unbiased perspective, and thus addresses all significant outcomes of the proposal.[77] Third, the process systematically approaches health outcomes by accepting the array of forces that affect individual and group health. Because of this, the HIA process is multidisciplinary, a fourth characteristic.[78] Finally, the analysis is flexible and adaptable, yet it follows a structural sequence of phases as explained above so that the evaluation of evidence is "explicit, transparent, and balanced."[79]

B. Undertaking a HIA

While most HIAs contain the elements and values described above, several basic steps are necessary to undertake the process of preparing a health impact assessment. Generally, the assessment should be implemented early in the policy making process so that its findings can influence policy makers.[80] Next, there is a screening and scoping process. Screening investigates the various policies and programs that might cause health impacts and analyzes what those health impacts might be, using information already available to the assessors.[81] Screening is used to determine whether to proceed with a full HIA, giving consideration to the significance of the potential health impacts, the value of additional information, and the feasibility of conducting the study.[82]

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[72] *Id.* at 5.

[73] *Id.* at 7.

[74] *Id.* at 4.

[75] Brian L. Cole et al., *Methodologies for Realizing the Potential of Health Impact Assessment*, 28 AM. J. PREV. MED. 382, 383 (2005).

[76] *Id.*

[77] *Id.*

[78] *Id.*

[79] *Id.*

[80] INTEGRATING PLANNING AND PUBLIC HEALTH, *supra* note 5, at 74.

[81] Gothenburg Paper, *supra* note 58, at 5; INTEGRATING PLANNING AND PUBLIC HEALTH, *supra* note 5, at 74.

[82] Cole, *supra* note 75, at 385.

If more information is needed, a scoping process should be implemented to determine what information is needed, how the information will be obtained, and from whom it will be obtained.[83] Scoping is undertaken to analyze the health impacts of the project, the method to use in the analysis, possible challenges, and necessary resources to complete the assessment.[84] An assessment can range from a short, systematic assessment to an in-depth examination of the policy, program, or project and its potential impact.[85] After scoping, various methodologies can be employed if undertaking the assessment is determined to be advisable. In general, a risk assessment identifies the group of people that will be impacted by the proposal and how they will be affected.[86] A quantitative assessment employs risk analysis to estimate a specific outcome of a proposal. Community-based assessments draw from the field of community-based health promotion and involve the local population in a process oriented approach.[87] Moreover, a procedural approach similar to an environmental impact assessment can be employed by using an efficient methodology to comply with mandates from government agencies to perform these assessments.[88]

C. HIAs in Practice

While the World Bank and the WHO advocate the use of HIA in government planning decisions, their use in the United States has only recently begun. HIA has been used in health agencies in Great Britain, Canada, Sweden, Australia, and New Zealand, and is increasingly being used in the United States.[89] Significantly, in October of 2004, the Robert Wood Johnson Foundation and the Center for Disease Control organized a meeting bringing together various experts in planning, public health, and HIA to promote and develop HIA in the United States.[90] Currently, no jurisdiction in the United States mandates the use of HIAs in the regulatory process because experts note that this idea is not politically achievable at this point.[91] However, various city health departments, including the San Francisco Department of Public Health and the Denver

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[83] Gothenburg Paper *supra* note 58, at 5.

[84] Cole, *supra* note 75, at 385.

[85] Gothenburg Paper, *supra* note 58, at 5.

[86] INTEGRATING PLANNING AND PUBLIC HEALTH, *supra* note 5, at 74.

[87] Cole, *supra* note 75, at 384.

[88] *Id.*

[89] *Id.*

[90] Andrew L. Dannenberg, *Growing the Field of Health Impact Assessment in the United States: An Agenda for Research and Practice*, 96 AM. J. PUB. HEALTH 262,270 (2006).

[91] INTEGRATING PLANNING AND PUBLIC HEALTH, *supra* note 5, at 74.

Health Department, have employed HIAs in their decision-making processes.

In conjunction with the National Association of County and City Health Officials, the Tri-County Health Department in the Denver region developed an HIA checklist to aid local health agencies in analyzing development, or re-development, applications in their communities.[92] The checklist can be used to improve the decision-making process, and to ascertain potential public health issues over which the public health department can assert authority.[93] Additionally, the checklist addresses other issues that may arise during the development process that would require policy changes in order to implement, while also encouraging the local health department to work with planners, local officials, and the public to increase awareness of the impact of land use planning on public health.[94]

While the Denver area checklist presents an example of a community devising an assessment to guide policy decisions in its community, the San Francisco Department of Public Health conducted a more formal HIA to thoroughly analyze health impacts in Environmental Impact Reports prepared under the state's Environmental Quality Act ("CEQA"), which is the state's version of the National Environmental Policy Act.[95] Using HIAs in association with the CEQA and the San Francisco Department of City Planning, the department analyzed the environmental and health consequences of the development of a 1600-unit high cost condominium development, and the demolition of a rent controlled apartment building and its replacement by a 1000-unit high cost condominium development.[96] In both cases, the results of the HIA were presented to decision-makers and while the analyses did not result in the disapproval of the projects, they did encourage city officials to focus on the impact of the displacement of affordable housing, and ultimately resulted in the developers providing more affordable units in the developments.[97]

IV. LAND USE REGULATION

While a host of evidence exists connecting public health problems with land use regulation, the functionality and adaptability of the land use

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[92] *See Public Health in Land Use Planning and Community Design*, NACCHO, *available at* http://www.naccho.org/toolbox/_toolbox/LandUseChecklist-03-10-03.pdf (last visited Oct. 17, 2015).

[93] *Id.*

[94] *Id.*

[95] INTEGRATING PLANNING AND PUBLIC HEALTH, *supra* note 5, at 76.

[96] *Id.*

[97] *Id.*

regulatory system provides the means for using HIAs to realign land use with public health by effectively incorporating public health into land use decision making. Opportunities exist in several areas of land use regulation, including planning, environmental impact assessments, zoning, discretionary permitting, public infrastructure, and regulatory implementation and enforcement. This section will describe these tools in the context of the land use regulatory system and cite authority for the incorporation of health impact assessments into each mechanism.

A. Planning

The planning process is a system designed to guide future land use decisions in a particular community.[98] While planning can include myriad specialties such as land use planning, transportation planning, environmental planning, regional planning, or planning for housing, the core of planning in the United States is the comprehensive plan.[99] In almost every jurisdiction, land use decision-making is required to be "in accordance with a comprehensive plan."[100] A comprehensive plan is a document setting forth a proposal for the general design of a community, taking into account the public welfare.[101] However, many jurisdictions that follow the mandate that zoning must be "in accordance with a comprehensive plan" do not require an adoption of a distinct planning instrument before engaging in zoning. Instead, those juridictions see the zoning ordinance as sufficient to meet the requirement if it appears to be rational and consistent with other zoning ordinances and local policies.[102] A growing number of jurisdictions now require the adoption of comprehensive plans, or require regulatory ordinances governing land use to be consistent with these plans.[103]

Although many see planning as a way to systematically solve various societal problems,[104] critics argue that planning is not a legitimate way to solve social problems because plans can be amended or not followed in the

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[98] Arnold, *supra* note 23, at 498; ERIC DAMIAN KELLY & BARBARA BECKER, COMMUNITY PLANNING: AN INTRODUCTION TO THE COMPREHENSIVE PLAN (Island Press 2000).

[99] KELLY & BECKER, *supra* note 98, at 3-4.

[100] Advisory Comm'n on Zoning, U.S. Dep't of Commerce, A Standard State Zoning Enabling Act Under Which Municipalities May Adopt Zoning Regulations, sec. 3 n.22 (rev. ed. 1926).

[101] KELLY & BECKER, *supra* note 98, at 44-45.

[102] *See, e.g.*, Wolf v. Ely, 493 N.W.2d 846 (Iowa 1992) (finding that where zoning must be "in accordance with a comprehensive plan" a plan apart from a zoning ordinance is not required).

[103] DANIEL P. SELMI & JAMES A. KUSHNER, LAND USE REGULATION: CASES & MATERIALS 182 (Aspen, 2nd ed. 2004).

[104] *Id.* (noting that planning was seen as a solution to the emerging problem of environmental degradation in the 1970s).

ad hoc decision-making process of the land use regulatory system.[105] The argument follows that piecemeal land use decisions are made at the whim of government officials, often captured by private interests, resulting usurpation the comprehensive plan.[106] However, some jurisdictions see the plan as a "constitution for development," [107] marshalling authority that planning with public health in mind may be feasible, at least in some places.

Mandatory requirements of comprehensive planning, usually found in a state's planning enabling act, provide opportunities to analyze health impacts and use HIAs for various aspects of the plan. Statutes in most jurisdictions simply mandate the adoption of a comprehensive plan or require decision-making to be "in accordance with a comprehensive plan." Yet, other statutes authorizing comprehensive planning require the consideration or study of various health related issues. For example, the Standard Planning Enabling Act requires that part of the purpose of the plan should be to promote health and safety, including fire safety, healthful population distribution, and the adequate provision of light and air.[108]

Florida's Act, although more comprehensive than most is also illustrative.[109] The Act requires that the plan state specific goals and policies, which *may* include those related to both public safety and health concerns.[110] In ensuring that the intent of the Act is accomplished, the Act directs the Governor's office to conduct various studies and reports. Specifically, the office is required to "prepare . . . specific data, assumptions, forecasts, and projections for use by each state or regional agency in the preparation of plans."[111] Additionally, in preparation for the revision of the comprehensive plan, the office is directed to conduct necessary "studies, reports, data collections, or analyses."[112] Finally, the office is also required to provide available data to public and private agencies, and the public itself.[113]

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[105] Carol M. Rose, *Planning and Dealing: Piecemeal Land Use Controls as a Problem of Local Legitimacy*, 71 CAL. L. REV. 839, 841 (1983).

[106] *Id.* at 855; Robert C. Ellickson, *Suburban Growth Controls: An Economic and Legal Analysis*, 86 YALE L.J. 385, 407-08 (1977); Bradley C. Karkkainen, *Zoning: A Reply to the Critics*, 10 J. LAND USE AND ENVTL. L. 45, 59 (1994).

[107] Arnold, *supra* note 23, at 499 (citing Citizens of Goleta Valley v. Bd. of Supervisors, 801 P.2d 1161, 1171 (Cal. 1990). Arnold, however, sees the plan as a set of guidelines, not rules, analogizing the plan to the "Pirate's Code" in *The Pirates of the Caribbean*).

[108] A STANDARD CITY PLANNING ENABLING ACT, § 7, U.S. DEP'T OF COMMERCE (1928), *available at* https://www.planning.org/growingsmart/pdf/CPEnabling%20Act1928.pdf.

[109] FLA. STAT. §§ 186.001-186.031; §§ 186.801-186.901. (2007).

[110] FLA. STAT. § 186.007(1), (3) (2007).

[111] FLA. STAT. § 186.006(4) (2007).

[112] *Id.* at (6).

[113] *Id.* at (9).

Florida's actual comprehensive plan contains numerous elements outlining goals and policies related to some of the health issues associated with land use, as described above. These include children's health, affordable and safe housing, public safety, crime, air quality, hazardous materials and waste, transportation, and health policies in general[114] Since the enabling act requires the state to conduct studies related to development of regional plans, or revisions to the state comprehensive plan, and since the state plan currently contains numerous goals and policies related to health, it seems that HIAs could be used to ensure compliance with those aspects of the plan. Because HIAs are useful sources of data collection and analyses, and are shared with public officials and the public (as required by the Florida statute), Florida and other states should consider using HIAs in fulfilling their planning obligations under their respective enabling acts for appropriate aspects of the plan. Even in states where the development of a comprehensive plan is not statutorily required, it is permissible and common practice to develop a written plan, and therefore HIAs can be used in planning when permissible, such as where studies or data collection are authorized in health related fields.

The HIAs can also be used for specific planning activities other than comprehensive planning.[115] While some scholars see comprehensive planning as a framework, with other types of planning incorporated into the comprehensive plan, others view comprehensive planning as a separate theory in the planning scheme and distinct from other types of planning, such as land-use planning, transportation planning, or neighborhood planning. Regardless of the viewpoint, where specific small-scale planning activities occur, especially on the local level, HIAs can be incorporated to guide decision-making. For example, planning for affordable and safe housing requires considerations of where the housing will be located, what kind of transportation options would be available, and how much housing needs to be available, and would thus benefit from an HIA to determine positive and negative health outcomes across multiple variables.[116] Polk County, Florida recently incorporated HIAs to review proposed developments in order to provide insight and alternatives to existing growth strategies that are currently lacking consideration of health and environmental impacts.[117] Therefore, HIA might also be incorporated into the local decision-making process in the context of land-use planning.

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[114] *See* FLA. STAT. § 187.201 (2007).

[115] KELLY & BECKER, *supra* note 98, at 3.

[116] *Id.* at 6.

[117] Timothy G. Mayer, *Development of a Health Impact Assessment (HIA) Protocol for Polk County, Florida 2005-2006*, HEARTLAND CTRS., *available at* www.heartlandcenters.slu.edu/ephli/finalprojects/3MayerReport.doc.

B. Environmental Impact Assessments

Another aspect of the land use regulatory system that may be ideal for the use of health impact assessments is the environmental impact assessment. The National Environmental Policy Act, passed by Congress in 1969, requires the preparation of an Environmental Impact Statement ("EIS") whenever a federal action could have a significant effect on the human environment.[118] An EIS should include the significant environmental effects of the project, alternative solutions to the project, the environmental effects of the alternatives, and significant effects that are unavoidable if the project is approved.[119] NEPA does not mandate that a certain result occur based on the assessment, but only that adverse environmental impacts are given appropriate consideration. Although NEPA only applies to actions taken by the federal government, and thus would not apply to local land use decisions, about twenty states have EIS requirements for state and local actions under similar state statutes.[120] Most State Environmental Policy Acts ("SEPAs"), modeled after NEPA, apply to discretionary state or local government decisions that "may" have a significant environmental impact.[121] Therefore, discretionary decisions such as a subdivision approval or rezoning would likely be subject to the state's SEPA.[122] Once an EIS is prepared, usually by a local agency, the court will determine whether the EIS was prepared in a way that allowed for informed decision-making.[123]

While NEPA requires consideration of human health impacts resulting from environmental changes, adverse health impacts alone do not prompt the preparation of an EIS.[124] California's Environmental Quality Act, which goes slightly beyond NEPA, does require an analysis of negative human impacts due to environmental change.[125] However, human health assessments, in conjunction with the statute, have been limited to chemical and physical hazards such as water pollution or chemical contamination, rather than focusing on the more indirect health impacts of policies such as the use of sidewalks to promote physical activity.[126]

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[118] National Environmental Policy Act, 42 U.S.C.A. § 4332(c) (West).
[119] *Id.*
[120] SELMI & KUSHNER, *supra* note 103, at 627.
[121] *Id.*
[122] *Id.*
[123] *Id.* at 632.
[124] INTEGRATING PLANNING AND PUBLIC HEALTH, *supra* note 5, at 74.
[125] California Environmental Quality Act, Cal. Pub. Res. Code § 21083(b) (West).
[126] INTEGRATING PLANNING AND PUBLIC HEALTH, *supra* note 5, at 74.

Indeed, health impacts from environmental contamination have been historically difficult to quantify. Although it is logical to assume that noxious land uses cause adverse health impacts, it is complicated to establish a causal relationship between the two based on reliable scientific evidence.[127] In some cases multiple land uses, such as several heavily polluting industrial facilities, might contribute to the same adverse health impacts, such as respiratory disease.[128] The lack of dependable measurements of actual emissions also presents a problem in preparing an accurate EIS.[129] Furthermore, the distance from the facility also affects human health, but the extent of the effect is unknown.[130] This makes quantifying the degree to which each use causes the health problems exceedingly difficult.

Additionally, scientific data on the health impacts of exposure to many toxic substances is unclear, as toxicological profiles exist for only 281 of the thousands of chemicals in the environment. [131] Little scientific evidence exists on the cumulative effects of different chemicals emitted in close proximity to one another and the resulting health impacts because the risk of exposure for each toxic substance is evaluated distinctly.[132] Moreover, the effect of the method of exposure (inhalation, ingestion, contact through the skin) causes uncertainties in risk assessments. Finally, risk assessments are often undertaken with a focus on the average individual and do not take into account that harm may occur at lower exposure rates for vulnerable members of the population such as children, the elderly, or persons with immune deficiencies.[133]

Despite the problems with accurately accounting for risk in environmental impact assessments, health impact assessments may be influential since formal health studies are rarely conducted where a relationship between a noxious land use and adverse health impacts is suspected.[134] As more data is accumulated describing the connection between land use decisions and public health, this data can be utilized and incorporated into the EIS under NEPA or similar state statutes.[135] Since

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[127] Juliana Maantay, *Zoning, Equity, and Public Health*, 91 AM. J. OF PUB. HEALTH1033, 1035 (2001).

[128] *Id.*

[129] *Id.*

[130] *Id.*

[131] *Id.; see also* AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY, TOXICOLOGICAL PROFILE INFORMATION SHEET (2015).

[132] Maantay, *supra* note 127, at 1035.

[133] *Id.*

[134] *Id.*

[135] William W. Buzbee, *Urban Form, Health, and the Law's Limits*, 93 AM. J. PUB. HEALTH 1395, 1397 (2003).

some state statutes go beyond NEPA and require not only consideration of environmental harms, but the execution of programs to mitigate or reduce environmental damage, an increased showing of the relationship between human health and environmental impacts may lead government officials to further consider health impacts in planning.[136] Although the potential for using HIAs through the regulatory process under NEPA has potential, commentators in the field of HIAs note that a process incorporating HIAs into the NEPA or SEPA regulatory process is not politically viable at this time.[137]This may be due to the still emerging connection between public health and environmental conditions.

Still, other nations have already begun using HIA as part of the EIS process. In 1996, the Australian state of Tasmania began requiring health impact assessments as part of the Environmental Management and Pollution Control Act.[138] All development proposals requiring the preparation of an EIS under the act must also prepare an HIA.[139] The purpose of the requirement is to actively integrate the process of HIAs into EIS preparation.

Additionally, Australia passed guidelines in 2001 that required the preparation of HIAs for site-specific development projects as a complement to EISs.[140] The purpose of the guidelines is to promote and enhance the use of HIAs in the impact assessment process by integrating a requirement to prepare HIAs in conjunction with the already existing EIS process.[141] The guidelines require that each jurisdiction include the need to address human health impacts in their already existing assessment processes, and directs the decision-making agency to ensure that human health is included in the issues to be addressed in the standards that describe their impact assessment process.[142]

Therefore, while scholars think the integration of health impact assessments into the EIS regulatory scheme in the U.S. is not politically feasible at this time, other jurisdictions have incorporated HIA into the EIS process. Presumably, state governments could expand their SEPAs to require the preparation of a HIA in conjunction with the EIS as more evidence links public health, environmental damage, and land use decision-making. This is more likely in jurisdictions that already require the

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[136] *Id.*
[137] INTEGRATING PLANNING AND PUBLIC HEALTH, *supra* note 5, at 74.
[138] ENHEALTH, HEALTH IMPACT ASSESSMENT GUIDELINES, 4 (2001).
[139] *Id.*
[140] Environmental Management and Pollution Control Act (Act No. 44/1994) (Tasmania).
[141] *Id.* at 1.
[142] *Id.* at 2.

consideration of health effects in the EIS, such as California.[143] Therefore, the incorporation of HIAs into the EIS process in the United States could be accomplished by amending the legislation authorizing EIS preparation to include a concurrent requirement that an HIA also be prepared, as has been done in other countries.

C. Zoning

Zoning is a regulatory land use technique that separates incompatible land uses into zones or districts based upon aspects such as the type of land use (e.g., industrial, residential, agricultural), the intensity of the use, and the height or bulk of the use.[144] In 1926, the United States Supreme Court recognized the constitutionality of zoning in *Village of Euclid v. Ambler Realty*, as a valid exercise of the state's police power to protect the health, safety, morals, and welfare of a locality.[145] While zoning has protected residents from the harmful effects of noxious industrial land uses by requiring a separation between the two, over time, zoning has tended to promote suburban sprawl and environmental injustice in some areas.[146]

Through the systematic separation of land uses, many commentators argue that zoning has promoted sprawl by encouraging low-density residential developments that inefficiently separate people from their jobs and retail establishments.[147] Because of the separation between land uses, an automobile-dependent society requires increasing transportation infrastructure such as parking lots and roadways to access these separated places, thus consuming more and more land as residences and places of business sprawl further apart. [148] Although zoning's original purpose of eradicating disease and poor living conditions in cities has, to an extent, been realized, the result is a new problem framed by sprawling communities, inefficient transportation, and environmental degradation.[149]

Despite the use of zoning to segregate incompatible land uses, poor and minority neighborhoods are disproportionately burdened by land uses

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[143] *See* California Environmental Quality Act, Cal. Pub. Res. Code § 21083(b) (West).

[144] KELLY & BECKER, *supra* note 98, at 203.

[145] Vill. of Euclid, Ohio v. Ambler Realty Co., 272 U.S. 365, 395 (1926).

[146] Wendy Collins Perdue et al., *The Built Environment and its Relationship to the Public's Health: The Legal Framework*, 93 AM. J. PUB. HEALTH 1390, 1391 (2003).

[147] KELLY & BECKER, *supra* note 98, at 210-212 (describing how zoning has influenced sprawl and commercial strips).

[148] *Id.*

[149] Al Norman, *Sprawl and the Coercive Force of Zoning Law: Fear and Loathing*, 6 VT. J. ENVTL. L. 90, 90 (2005).

that tend to cause health problems.[150] This may occur because zoning is a political process. Poor and minority communities lack political power, so they may have insufficient resources to combat a zoning change that would bring an unwanted facility to their neighborhood.[151] Furthermore, districts zoned for manufacturing or industry may be adjacent to residential neighborhoods, or may be concentrated in a part of the city traditionally occupied by low-income or minority residents.[152] As a result, zoning has either promoted or permitted unhealthy land uses in poor and minority neighborhoods.

HIAs may be influential in remedying the unhealthy land use patterns perpetuated by zoning. The adverse effects of sprawl and environmental injustices can be remedied by amendments to the zoning code, or zoning map, to promote mixed-use or transit oriented developement, or to prohibit harmful industrial land uses in proximity to residences. An amendment to the text of the zoning ordinance can create a new area or change the uses allowed in a certain zone, while an amendment to the zoning map can change the designated uses for a certain piece of property.[153] Thus, HIAs can be used as part of an environmental justice-oriented comprehensive rezoning effort, or in conjunction with an environmental justice audit, to provide information about the land use conditions in a community, as well as the environmental and health impacts on that community.[154]

D. Discretionary Permitting and Flexibility Devices

At its core, the land use regulatory system provides for project specific discretionary permitting of land use.[155] To combat the rigidity of Euclidian zoning, and to adapt to the unforeseen nature of certain land uses (e.g. minerals or oil found on property that would not allow mining under the zoning regulations), flexible, discretionary permitting techniques have developed. These include conditional use permitting, subdivision maps, and planned unit developments. "The overwhelming majority of land use controls, at least in effect or impact, are project-by-project negotiated discretionary permits authorizing private landowners to engage in specific

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[150] *See, e.g.*, LUKE COLE & SHEILA FOSTER, FROM THE GROUND UP: ENVIRONMENTAL RACISM AND THE RISE OF THE ENVIRONMENTAL JUSTICE MOVEMENT (N. Y. U. Press 2000).

[151] *See* Maantay, *supra*, note 127, at 1038.

[152] *Id.*; *See, e.g.*, Robert Bullard, *Solid Waste Sites in the Black Houston Community*, 53 SOC. INQUIRY 273 (1983).

[153] SELMI & KUSHNER, *supra* note 103, at 75.

[154] *See* Arnold, *supra* note 23, at 498.

[155] *Id.* at 492.

land uses but subject to certain conditions exactions, and limits under: a) broad decision-making standards, b) standardized yet relatively adaptable procedures, c) the dominance of local government regulation, and d) the super-dominance of private property norms."[156] However, due to the procedural and evidentiary requirements that govern the bodies that approve these permit applications, there is an opportunity to use HIAs in this ad hoc, discretionary process.

There are various types of discretionary permits. Conditional use permits stipulate certain specifically mentioned uses of land, not particularly authorized by the zoning, on the issuance of a permit by the decision-making body.[157] Since certain land uses may only be appropriate in certain circumstances and under certain conditions, such as a day care center in a residential neighborhood, the decision-making body must consider whether that particular land use is appropriate through the permitting process. Similarly, a subdivision map, which seeks to divide a parcel of land into multiple parcels for development[158], requires approval by the decision-making body based on pre-defined standards set out by the legislature.[159] A planned unit development ("PUD") can also be adopted by permitting, and allows property owners to cluster or configure lots or promote mixed use development in areas where zoning might not normally allow such uses.[160]

Generally, permit decisions involving these flexible tools are adjudicative and made by the planning commission or board of adjustment, with a right of appeal to the governing body, such as the city council.[161] There are several procedural requirements the board must follow in making permit decisions. A permit can only be granted following notice and a public hearing, where the board hears public comment on the proposed permit.[162] The board must then hear enough evidence so that a reasonable person would be able to make an informed decision.[163] This is often known as the substantial evidence standard, which is a lesser standard than finding a preponderance of the evidence.[164] Finally, in most juristictions the

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[156] *Id.* at 480.

[157] *See id.*

[158] *See generally* KY. REV. STAT. § 100.111(22) (2015).

[159] *See* Arnold, *supra* note 23 at 454.

[160] SELMI & KUSHNER, *supra* note 103, at 97; KELLY & BECKER, *supra* note 98, at 217. Other jurisdictions require the city to adopt an ordinance permitting a PUD district.

[161] SELMI & KUSHNER, *supra* note 103, at 89.

[162] *Id.*

[163] *Id.*

[164] *Id.*

impartial decision-making body must link the evidence to the criteria governing the decision.[165]

In addition to following the procedural requirements outlined above, the decision makers must make the permitting decision based on certain legislatively defined criteria, which usually relate to the public welfare and general public interest.[166] To approve a discretionary permit, the counsel usually must find that the proposed project is not detrimental to the health, safety, morals, and welfare of the community; that the project will not adversely affect adjoining land uses; that the size and shape of the parcel is adequate for the project; and that traffic conditions will not be adversely affected by the project.[167] If the decision-maker finds that the proposed project meets the criteria, it must approve the project, and vice versa.[168]

However, while the decision must be based on certain criteria, there is a great deal of flexibility and discretion built into the decision-making process.[169] For example, as Tony Arnold notes, decision-makers "are likely to impose specific conditions on the applicants' permit if they grant it, tailoring the conditions in such a way as to avoid, minimize, or mitigate any impacts the project may have."[170] Conditions placed on the permit cannot, however, merely regulate the owners of the property, but must relate to the actual use of the property.[171] Therefore, while the board might approve a permit application from a developer, it might set conditions on the permit to ensure neighboring properties are not burdened by excessive noise or traffic arising out of the project.[172] Likewise, a bar may be required to limit its hours or provide security for the safety of neighbors.[173]

Additionally, negotiations between landowners, the decision-maker, and community members is common practice in determining what kinds of conditions should be placed on the permit.[174] Since a public hearing is procedurally required, and the decision to grant the permit must be based on substantial evidence, neighbors or others in opposition to the permit have the opportunity to submit evidence in opposition to the proposed project. Furthermore, the permit decision must be based on certain criteria,

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[165] *Id.*

[160] *Id.*

[167] *See* Arnold, *supra* note 23, at 481; SELMI & KUSHNER, *supra* note 103, at 89

[168] *See* SELMI & KUSHNER, *supra* note 103, at 89.

[169] Arnold, *supra* note 23, at 481.

[170] *Id.*

[171] SELMI & KUSHNER, *supra* note 103, at 89 (citing Baughman v. Bd. Of Zoning Appeals for Harrison Township, 2002 WL 1773043 (Ohio App. 2002)).

[172] *Id.*

[173] Marice Ashe et al., *Local Venues for Change: Legal Strategies for Healthy Environments*, 35 J. L. MED. & ETHICS 138, 141 n.39 (2007).

[174] Arnold, *supra* note 23, at 480.

which generally include consideration of the project's effect on the public health, safety, and welfare. As such, HIAs may be used in an evidentiary manner at a public hearing to show that the project should not be approved because of its adverse effect on the public health, or used in discussion with the developer and decision-maker to negotiate conditions to mitigate such effects, even if the permit is ultimately approved.

Since the HIA is a flexible tool that can range from a few sentences to a lengthy report, neighbors can tailor the HIA to reflect the gravity of potential harm caused by the project, and the funding needed to carry out the HIA. Additionally, because the HIA considers both the positive and negative health implications of the project, it is a good piece of evidentiary material for use in negotiations because it appears unbiased. Therefore, even if the permit is ultimately approved, an HIA can be beneficial in determining where adverse health effects might occur, and can provide support for mitigation measures or other permit conditions. Finally, because the decision must be based on substantial evidence, the HIA is useful if the neighbors wish to appeal the decision. If the HIA shows substantial adverse health impacts stemming from the project, the neighbors may be able to argue that the decision did not conform to the standards.

E. Public Infrastructure

Infrastructure refers to public facilities, such as roads, sidewalks, sewers, parks, and schools that are essential to sustain development.[175] In response to the high costs of infrastructure, and the inability of the tax base of low-density suburban developments to support the increasing costs, local governments sought to require developers to finance the costs of infrastructure, and even other improvements, as a condition of permit approval.[176] These forced costs, known as "exactions," were upheld on a limited basis in two prominent United States Supreme Court cases: *Nollan v. California Coastal Commission*[177] and *Dolan v. City of Tigard*[178]. Together, the cases require that exactions imposed on developers as a condition of permit approval have an "essential nexus" to the purpose for requiring the permit, and the exaction must be "roughly proportional" to the impact of the development project.[179]

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[175] SELMI & KUSHNER, *supra* note 103, at 143.
[176] *Id.* at 144.
[177] Nollan v. Cal. Coastal Comm'n, 483 U.S. 825, 854 (1987).
[178] Dolan v. Tigard, 512 U.S. 374, 383 (1994).
[179] *Id.* at 386.

In *Dolan*, a property owner challenged the city's requirement that she dedicate a portion of her property for greenspace and a bicycle path adjacent to a floodplain after seeking to expand a commercial building on her property and build a parking lot.[180] The court found that an essential nexus existed between the legitimate state interests of preventing flooding and reducing traffic congestion, and the requirement that the property owner set aside greenspace next to the creek to provide for a bicycle path.[181] However, the court held that the city failed to prove a rough proportionality between the need for a public greenway and the prevention of flooding along the creek.[182] Additionally, despite the fact that the city estimated an increase in traffic because of the expansion of the store, the court found no rough proportionality existed between the need for a bike path and the avoidance of excessive traffic congestion because the city did not produce evidence showing that the bike path would actually decrease traffic.[183]

Dolan's rough proportionality test requires that the city "make some sort of individualized determination that the required dedication is related in nature and extent to the impact of the proposed development."[184] The city did not have affirmative evidence that the bicycle path would offset traffic congestion, but rather made a conclusory statement asserting the connection. Consequently, the Court held this insufficient to meet the requirements of the test.[185] In *Dolan*, the court sought to require a finding of fact that the bicycle path "*will*, or is *likely to*, offset some of the traffic demand."[186]

The requirements of factual information to support exactions might be met with HIAs as a tool to identify specific health related impacts of proposed development projects. For example, in communities seeking to promote active lifestyles to combat the adverse health effects of obesity, the locality may seek to require a developer to provide bicycle paths or to set aside land for parks and trails. These conditions would likely pass the essential nexus test because they are reasonably related to the legitimate state goal of promoting public health. Additionally, a rough proportionality could be shown by employing health impact assessments demonstrating that such developments would pose adverse health effects and that the proposed conditions would mitigate those health effects.

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[180] *Id.* at 379.
[181] *Id.*
[182] *Id.* at 391.
[183] *Id.* at 390.
[184] *Id.* at 391.
[185] *Id.* at 392.
[186] *Id.* at 395.

Although some states prior to *Dolan* required only broad assertions linking the exaction to the negative effects of the development proposal, several states required more heightened standards requiring a specified articulation between the adverse effects of the exaction and the proposed development.[187] Both approaches were rejected in *Dolan* in favor of the "reasonable relationship" test, which requires that the exaction bear a reasonable relationship to the harms caused by the development.[188] Admittedly, the reasonable relationship test is not as strict as the higher standard, which requires that the "exaction must be found necessary to alleviate a harm that will be caused specifically by the proposed development and is not attributable to development in general."[189]

However, the rough proportionality test does require that the "city make some individualized determination that the required dedication is related both in nature and extent to the impact of the proposed development."[190] In *Dolan*, the court found that mere statistics displaying how the creation of a bike path "could offset some of the traffic demand" and lessen traffic congestion were not sufficient to pass the rough proportionality test.[191]

Instead, the Court would require some type of analysis showing an affirmatively beneficial relationship between the exaction and the stated adverse impact supported by conclusory evidence. Thus, where the exaction must be necessary to alleviate the negative externalities caused by a particular development, HIAs would be beneficial because they focus specifically on the health impacts caused by the project. Evidence gleaned from the HIA could also be used to support the use of exactions under *Dolan* where an exact cause-and-effect relationship is required.

F. Regulatory Implementation and Enforcement

Various regulatory measures impact public health in communities. Those specific to land use include environmental regulations as well as housing and building codes. Both poor housing conditions and environmental contamination can be significant barriers to public health within communities. Regulation and enforcement designed to improve these conditions may contribute to the alleviation of adverse health impacts to individuals and communities.

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[187] *See* Christopher J. St. Jeanos, *Note: Dolan v. Tigard and the Rough Proportionality Test: Roughly Speaking, Why Isn't Nexus Enough?*, 63 FORDHAM L. REV. 1883, 1889-90 (1995).

[188] Dolan v. Tigard, 512 U.S. 374, 390-91 (1994).

[189] *Id.*

[190] *Id.* at 391.

[191] *Id.* at 395.

Beginning in the 1970's, environmental laws and regulations sought to address the undesirable impact pollutants and other land use practices have on the environment. Some federal and state laws and regulations directly or indirectly affect public health by requiring the establishment of air and water quality standards,[192] which regulate elements and other chemicals such as lead or pesticides,[193] while also managing the location and clean up of hazardous waste,[194] the safety of drinking water,[195] and the disposal of solid waste.[196] While many of these laws are federally mandated, some have delegated authority to implement the law to the states, or in cases where the law or regulation only applies to federal action, a state may have created a similar state policy to mirror the federal act.

Additionally, housing and building codes, as well as federal housing laws or agencies, can promote public health through housing initiatives. For example, the Department of Housing and Urban Development promotes equal access to housing and combats housing discrimination through the Fair Housing and Equal Opportunity Division.[197] Building codes require housing to meet certain requirements to make sure they are structurally sound, while federal laws might control indoor environmental pollutants harmful to health.

HIAs can be used to promote the implementation of regulations or laws to improve public health. Many laws or regulations aimed at the protection of public health are created in response to public outcry in light of a publicized and well-supported health problem. Rachel Carson's *Silent Spring* is the prime example of the ways in which information concerning adverse health impacts can produce policy changes. Carson's work extensively documented the adverse effects of the chemical DDT on public health and the environment, which led to a ban of the chemical ten years after the books publication in 1972.[198] Part of the decision to ban DDT hinged on the thorough scientific evidence presented by Carson in her

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[192] *See, e.g.*, Clean Air Act, 42 U.S.C. § 7401 (2012); Clean Water Act, 33 U.S.C. § 1251 (2012).

[193] *See, e.g.*, Federal Insecticide, Fungicide, and Rodenticide Act, 7 U.S.C. 136 (2012); Toxic Substances and Control Act, 15 U.S.C. 2608; Residential Lead Based Paint Hazard Reduction Act of 1992, 42 U.S.C. § 4852 (2012).

[194] *See, e.g.*, Comprehensive Environmental Response, Compensation and Liability Act of 1980, 42 U.S.C. § 9601 (2006).

[195] *See, e.g.*, Safe Drinking Water Act, 42 U.S.C. § 300(f) (2012).

[196] *See, e.g.*, Solid Waste Disposal Act, 42 U.S.C. § 6901 (2012).

[197] *See Fair Housing and Equal Opportunity*, HUD, http://portal.hud.gov/hudportal/HUD?src=/program_offices/fair_housing_equal_opp (last visited Sept. 14, 2015).

[198] *See generally* RACHEL CARSON, SILENT SPRING (Houghton Mifflin, N.Y. 1962); Press Release, EPA, DDT Ban Takes Effect (Dec. 31, 1972) http://www2.epa.gov/aboutepa/ddt-ban-takes-effect.

book.[199] Similarly, because HIAs provide an objective and methodological approach to assessing health impacts of certain policy decisions, they might be influential in assisting in the passage of regulatory enforcement measures to improve public health through land use decisions, especially since HIAs address both the positive and negative health effects of a certain land use decision.

Additionally, HIAs can aid in the enforcement of already existing regulations. Many enforcement activities exist in the land use regulatory context, including the requirement that a property owner secure a permit before engaging in certain types of development, and the attached time limits and periodic review of permits that are issued.[200] Moreover, building inspections, housing codes, inquiries into public nuisances, and even public complaints or opportunities for public commentary in light of zoning amendments or other land use decisions offer opportunities to enforce land use regulations and impact decision-making.[201] However, Professor Tony Arnold notes that "public education, accessible and understandable information, and interactions between government staff and interested persons (e.g., landowners, developers, community groups, the general public) create less formal, but more effective, regulatory enforcement mechanisms than do more formal legal processes."[202] Therefore, evidence obtained from a HIA presented in those types of atmospheres may aid in regulatory enforcement measures as well.

V. OPPORTUNITIES AND BARRIERS TO USING HEALTH IMPACT ASSESSMENTS IN LAND USE REGULATION

While the land use system arose in part out of public health concerns (zoning for purpose of public welfare, nuisance law, etc.), its sole purpose is not to protect public health, but to mediate between people and places.[203] Therefore, public health is only part of the consideration in any land use decision-making process.[204] As a result, other issues such as economic development, job growth, and the desire to live in large and excessively designed suburban housing, might be incompatible with public health goals, especially in light of the only recently emerging evidence connecting

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[199] Dorothy McLaughlin, *Silent Spring Revisited*, PBS, http://www.pbs.org/wgbh/pages/frontline/shows/nature/disrupt/sspring.html (last visited Oct. 30, 2015).

[200] Arnold, *supra* note 23, at 501-02.

[201] *Id.* at 500-01.

[202] *Id.* at 502.

[203] *Id.* at 513.

[204] *Id.*

land use with adverse health impacts. Therefore, because what is in the public welfare is open for interpretation, and varies based on the political, economic, and social context in a community, public health might not always be a key factor in the decision-making process.

Additionally, because land use decisions are often made on a piecemeal basis in a local environment, the public health effects of the decision might be far removed from the locality, and thus not given much attention in the local decision making context. For example, a decision to cite a certain industrial facility in a Midwestern town, such as a power plant, might have far reaching effects on the air quality in the Northeast. Although federal regulations and laws concerning emissions might alleviate the problem in some instances, this type of public health concern would not likely factor into the decision-making process unless the impact of a decision advantageous to public health would be felt locally. Furthermore, local officials would presumably only consider local impacts to public health in land use initiatives because they are elected officials and want to show constituents that they are doing something constructive in *their own* communities. Thus, because the land use system is locally based, the health impact assessment in this context might not address widespread public health problems.

Other barriers to the use of HIAs in land use decision making result from the fact that the causes of health problems are often multi-faceted. For example, while there is a connection between transportation planning and suburban sprawl, dependence on automobiles, and asthma rates, land use planning alone will not solve the fact that automobiles generate air pollution. Other regulations on the state and federal level are necessary to curb the harmful effects of automobile pollution through the promotion of renewable fuels, hybrid powered vehicles, or a more strict regulation of the fuel industry. Additionally, the cost of undertaking the assessment may not be feasible in all cases, or the data gathered from the assessment may not conclusively support the hypothesized public health problem in the particular location.

However, interdisciplinary efforts are increasingly addressing public health problems. Because the land use regulatory system is adaptive and functional, the system allows for interdisciplinary collaboration to address health concerns in the process of designing sustainable and healthy communities. For example, many communities are aligning planning with public health and incorporating health impact assessments into this process.[205] Other communities are using legislative relationships to

[205] Daniel A. Rodriguez, et al., *The Healthy Choice*, AM. PLAN. ASS'N (Mar. 2007), https://planning.unc.edu/people/faculty/danielrodriguez/healthychoicewitheditions.pdf (noting that

encourage key players from across diverse disciplines to come together to discuss pertinent health problems.[206] Furthermore, although not widely practiced in the U.S., referrals or joint project reviews could be mandated where the project involves multiple sectors, such as transportation, health, and planning.[207] HIAs may also be able to address one of the key barriers to interdisciplinary collaboration; the absence of data to support particular common policy goals.[208]

VI. CONCLUSION

An increasing amount of research connects some of society's most devastating health problems to land use patterns. While land use might not always be the most formidable enemy, it is becoming clearer that how we use land on all scales, from city wide zoning that encourages sprawl,to building codes that regulates individual dwellings, can affect health. Although the rising levels of childhood obesity may equally be attributable to the proliferation of unhealthy food or the advent of video games, it is evident that more walkable communities generate more physical activity, which could help to curb this public health problem. Similarly, other land use patterns have placed the most vulnerable individuals in some of the most unsafe areas, partly through exclusionary zoning and land use decisions that perpetuate these problems.

The land use system, as a largely discretionary system that intercedes between people and places in a largely ad hoc basis, might not always side with public health. However, the use of HIAs can further the case for public health by objectively quantifying the risks and benefits of certain land use decisions to human health. Land use decisions are based on many factors, those of which include politics, economics, assessments that outline the adverse health effects of a decision, or the positive health effects of a proposal. However, these may influence the decision making process in favor of public health, especially when coupled with other approaches such as community education and participation, or environmental impact assessments. As a result, HIAs can positively benefit land use decision-

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San Francisco has involved health officials in using HIAs in development project decisions in three neighborhoods. London also uses HIAs in various sectors, including economic development and transportation).

[206] Richard Jackson et al., *Land Use Planning: Why Public Health Must Be Involved*, 30 J.L. MED. & ETHICS 70 (2002) (discussing the process for addressing childhood obesity in New Haven, CT through a collaboration with land use planners, school officials, day care commissioners, pediatricians, and others).

[207] *Id.*

[208] *Id.*

making and should be incorporated into the various land use tools in conjunction with a more interdisciplinary approach to land use regulation.